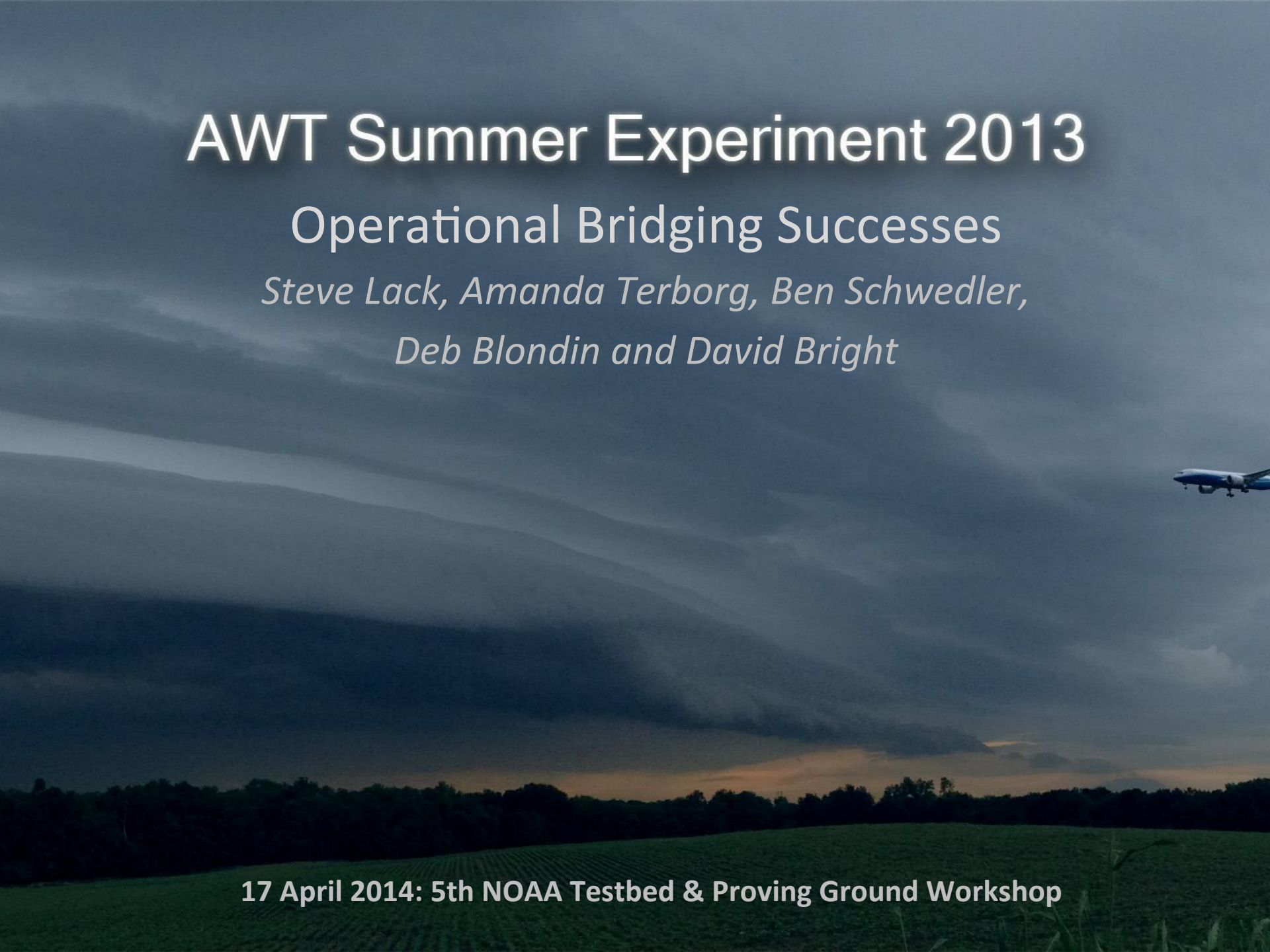


AWT Summer Experiment 2013

Operational Bridging Successes

Steve Lack, Amanda Terborg, Ben Schwedler,

Deb Blondin and David Bright

17 April 2014: 5th NOAA Testbed & Proving Ground Workshop

Aviation Weather Services Branch

CWSU ZKC

NextGen

MDL

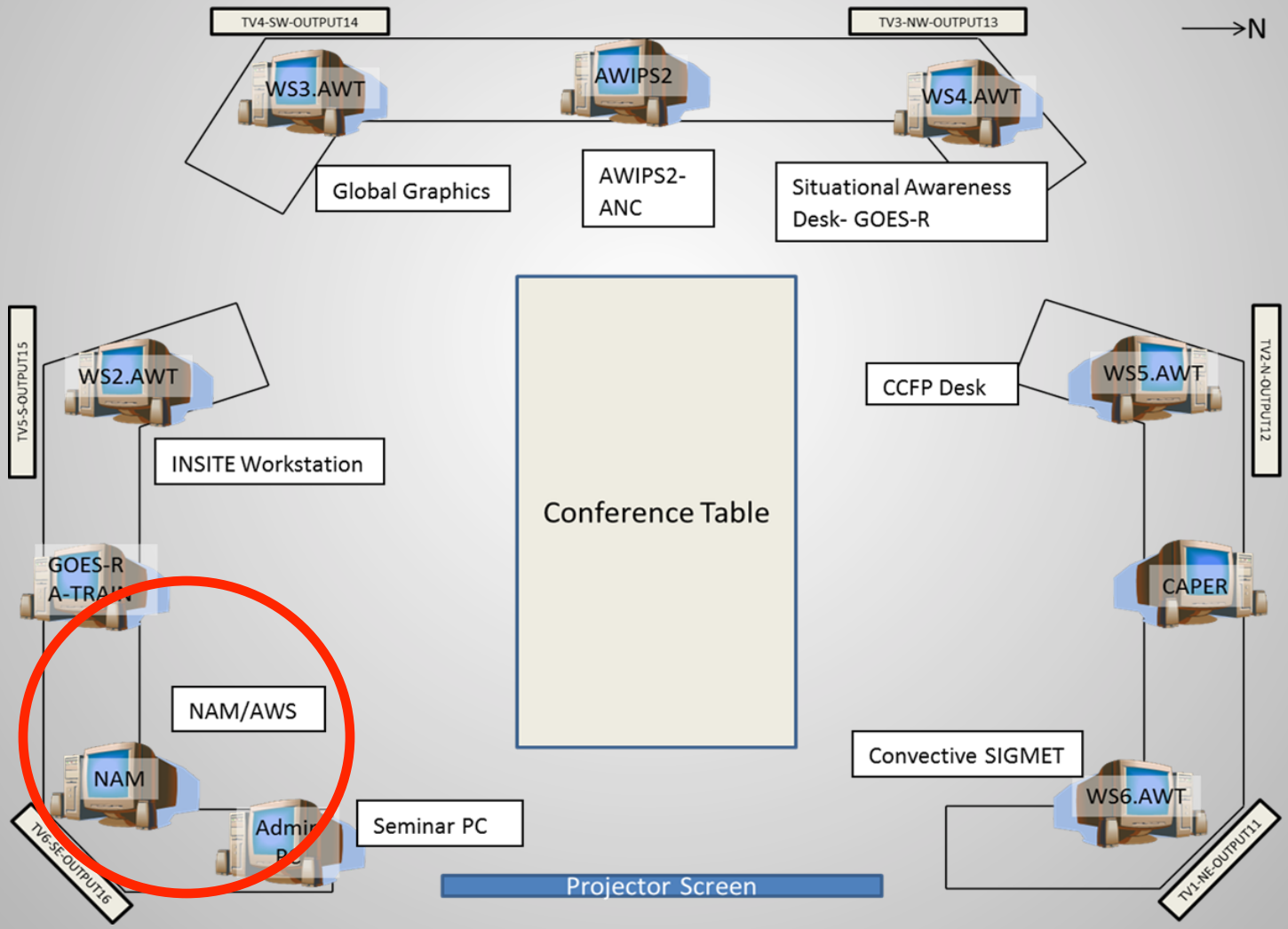
Overall Goals

- Simulate operational environment focus on convection
  - Experimental product examination
    - GOES-R
    - AWRP Products (Large Scale Convective Initiation, EPOCH)
    - HRRR Convective Probability Forecasts
  - Experimental AWC output
    - CSIG 2-h outlook
    - CCFP text annotation
    - Aviation Weather Statement to CONUS
- Brownbag seminars

Brownbag Seminars

Speaker	Organization	Topic
Missy Petty	NOAA/ESRL/GSD	INSITE Overview
Justin Sieglaff	UW CIMSS/SSEC	Cloud Top Cooling Algorithm
Mamoudou Ba	NOAA/MDL	AutoNowCaster
Steve Weygandt	NOAA/ESRL/AMB	HRRR Updates
Mike Eckert	AWC-NAM	NAM/ATCSCC Overview
Randy Baker	UPS	UPS Operations
Ed Szoke	CIRA	GOES-R Proving Ground
Lori Schultz	UAH/ESSC	Convective Initation Algorithm
James Pinto	NCAR	Large-scale Convective Storm Likelihood Product
Wayne Feltz	UW CIMSS/SSEC	Hazardous Turbulence Detection
Bill Callahan	Earth Networks	Earth Network Lightning Detection Network
Randy Bass	FAA/AWRP	Understanding Uncertainty Information in Aviation (General Dynamics)
Haig Iskenderian	MIT/LL	Forecast Confidence Concepts
Jamie Vavra	NOAA/NextGen	NOAA NextGen Program Office Overview

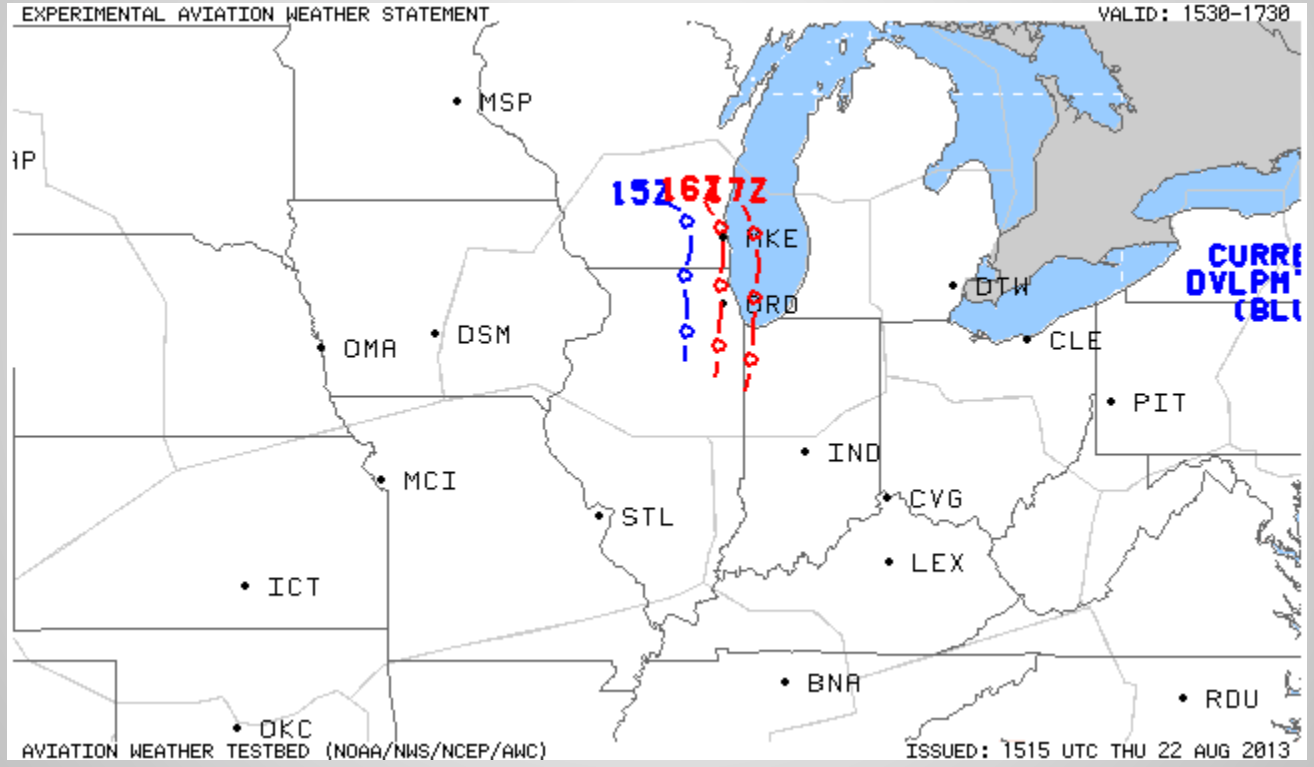
Testbed Layout



National Aviation Meteorologist (NAM) Desk Overview

- Outlook and Aviation Weather Statement (AWS)
  - Key interaction with decision makers at the command center… major stakeholder
  - Northeast AWS have been experimentally issued the last few summers (highest traffic density)
- AWS is event driven
  - Use of real-time data observational data and nowcast data
    - Strong GOES-R usage, Amanda Terborg is our local GOES-R specialist
  - Supplements the routine issuance product (CCFP) for convection
  - Expanded to CONUS domain for evaluation in 2013 Summer Experiment
  - Also issued for reduced ceiling and visibility
    - See Chad Gravelle's talk

Aviation Weather Statement (AWS) Graphic



Accompanying Text for AWS

EXPERIMENTAL AVIATION WEATHER STATEMENT 0022
NWS AVIATION WEATHER TESTBED KANSAS CITY MO
1509 UTC THU 22 AUG 2013

VALID TIME...1530-1730

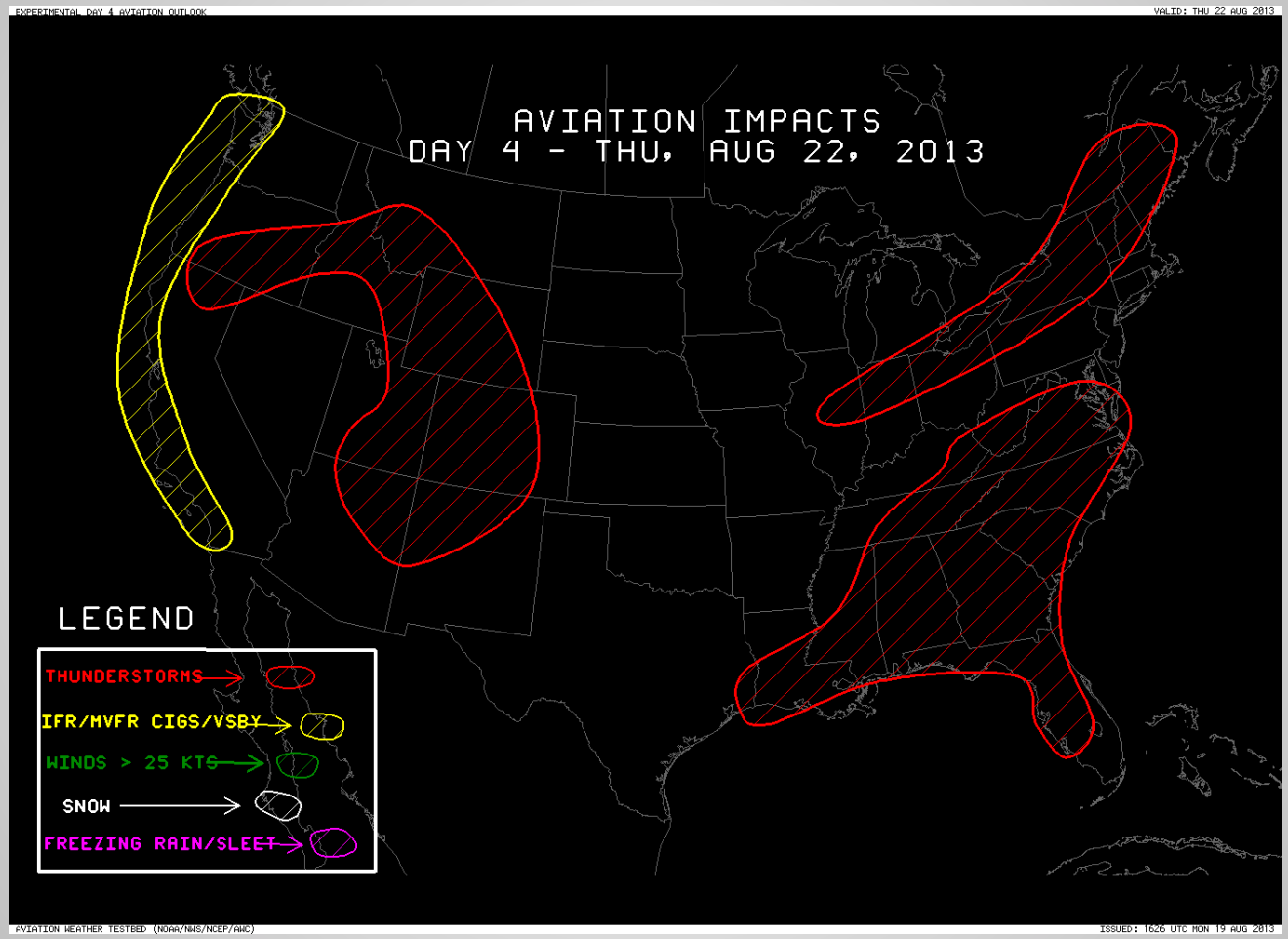
NAS ELEMENTS EFFECTED...C90 TRACON AIRSPACE...MDW...ORD

CONSTRAINTS...BROKEN LINE OF THUNDERSTORMS NOW MOVING THROUGH THE C90 AIRSPACE DEPICTED IN BLUE. LINE IS MOVING EAST AT 20KTS AND WILL IMPACT MDW/ORD BY 16Z. CONTINUED EASTWARD MOVEMENT IS EXPECTED WITH THE LEADING EDGE NEAR THE EASTERN BOUNDARY OF THE C90 AIRSPACE BY 17Z.

ONSET OF TERMINAL IMPACTS EXPECTED NEAR 1530Z...WITH CESSATION NEAR 17Z.

THUNDERSTORMS EXPECTED TO CLEAR THE C90 AIRSPACE NEAR 1830

Command Center Outlooks



Day 2-7 outlooks are issued by the NAMs for staffing considerations at the Command Center

GOES-R AWT Products

Demonstrated Product	**Category**
Simulated Cloud and Moisture	Baseline
Nearcasting Model	Risk Reduction
Convective Initiation	Future Capability
Cloud Top Cooling/Overshooting Top Detection	Future Capability
Psuedo Geostationary Lightning Mapper	Baseline
GLD360, NLDN, and ENTLN Lightning Stroke/Density	Baseline
GOES-14 Super Rapid Scan Imagery	Baseline
ACHA Cloud Height Algorithms	Baseline
Fog and Low Stratus	Baseline

Category Definitions:

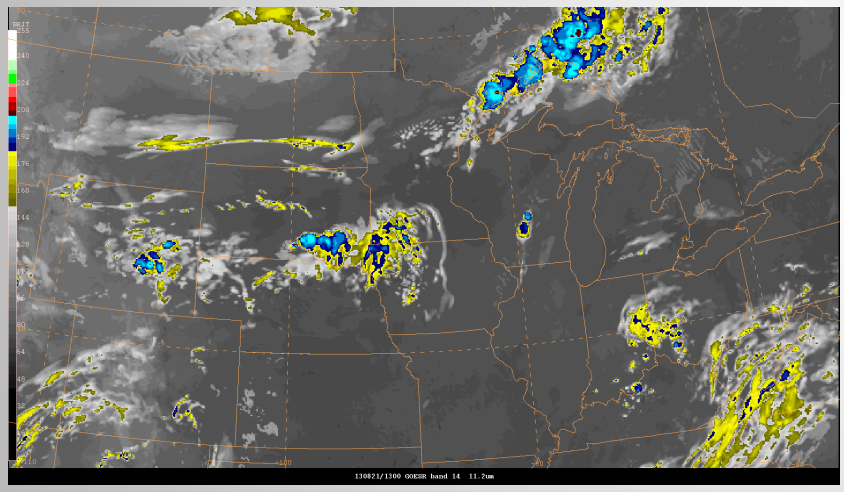
Baseline Products - GOES-R products providing the initial operational implementation

Future Capabilities Products - New capability made possible by ABI

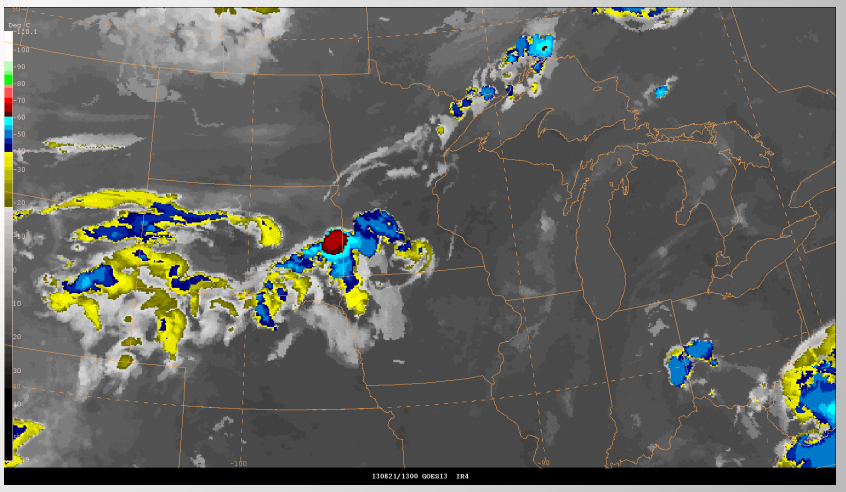
Risk Reduction – Research initiatives to develop new or enhanced GOES-R applications and explore possibilities for improving current products

GOES-R Simulated Imagery

WRF Simulated Imagery (IR)

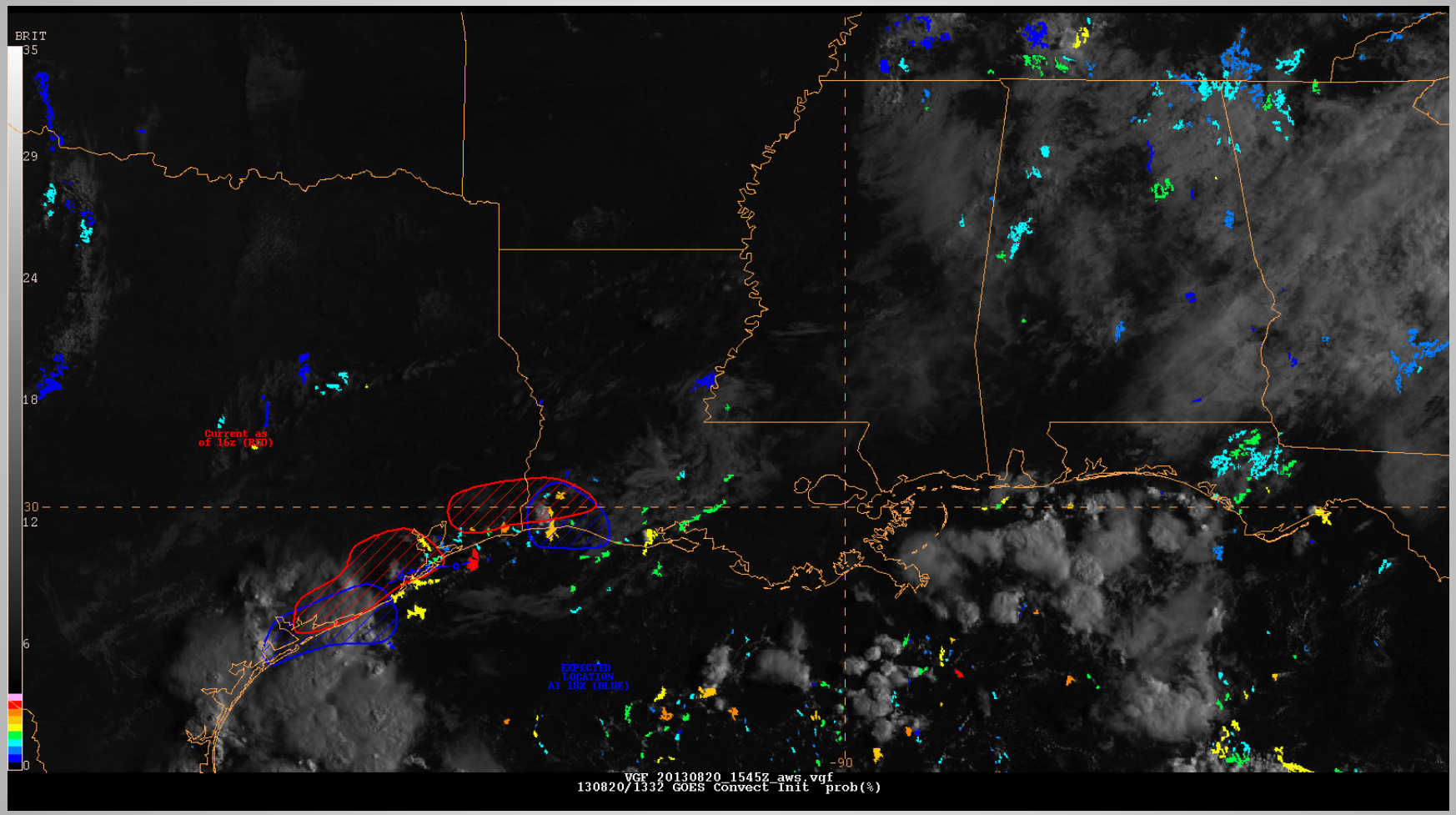


NAM Nest Simulated Imagery (IR)



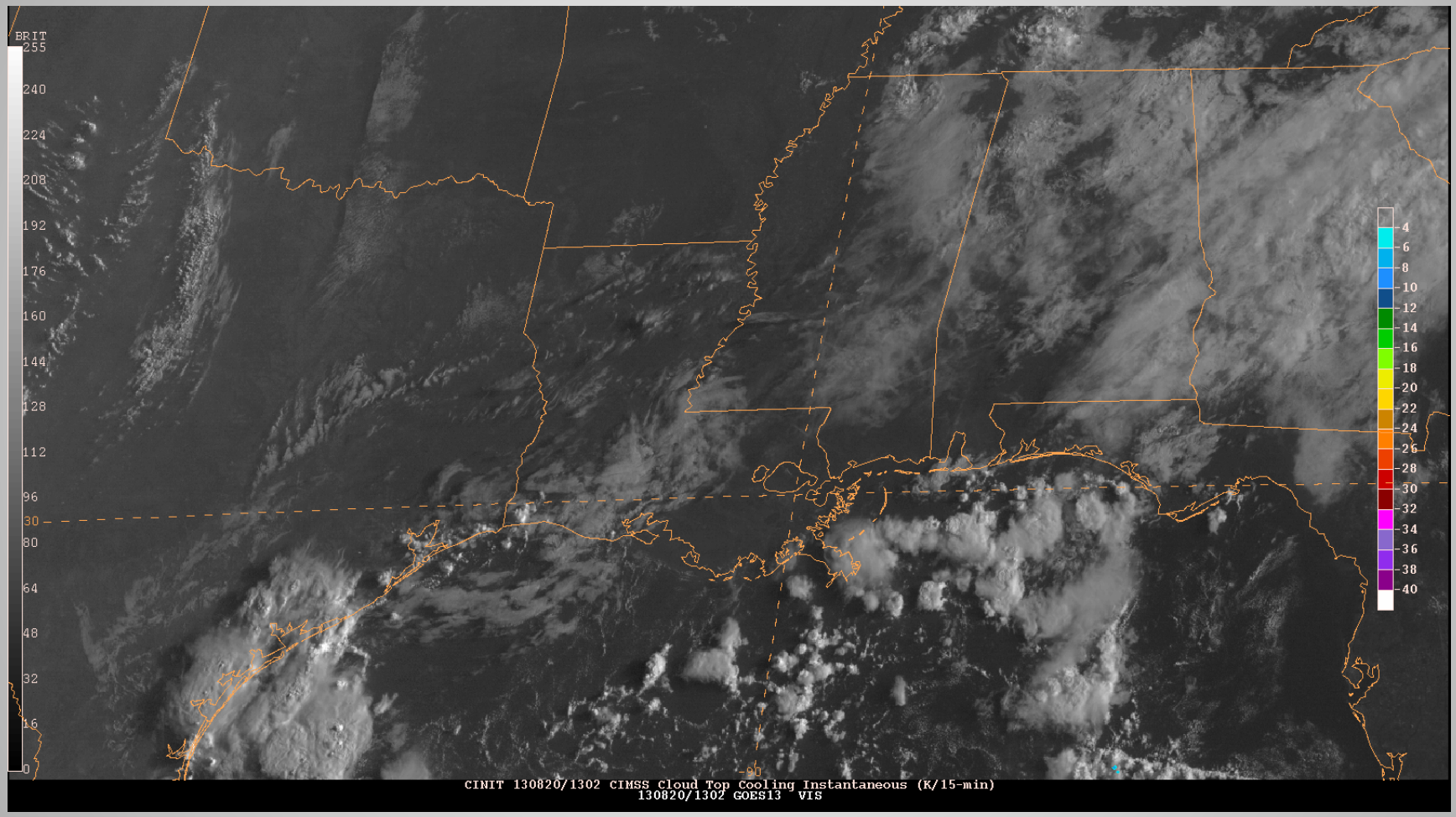
Although primarily used to simulate the bands that will be available in GOES-R the forecasters found great use out of the imagery as a forecast tool, especially water vapor and IR.

GOES-R Convective Initiation



GOES-R CI from 20 August 2013 at 1332 UTC and the 1545 UTC AWS. An increasing trend in probabilities was noted along the TX and LA coast, and the first CTC signals further narrowed down particular issue areas, one in TX associated with the ongoing convection, and the other on the border of TX and LA associated with both higher CI probabilities and moderate CTC cooling signals

GOES-R Cloud Top Cooling



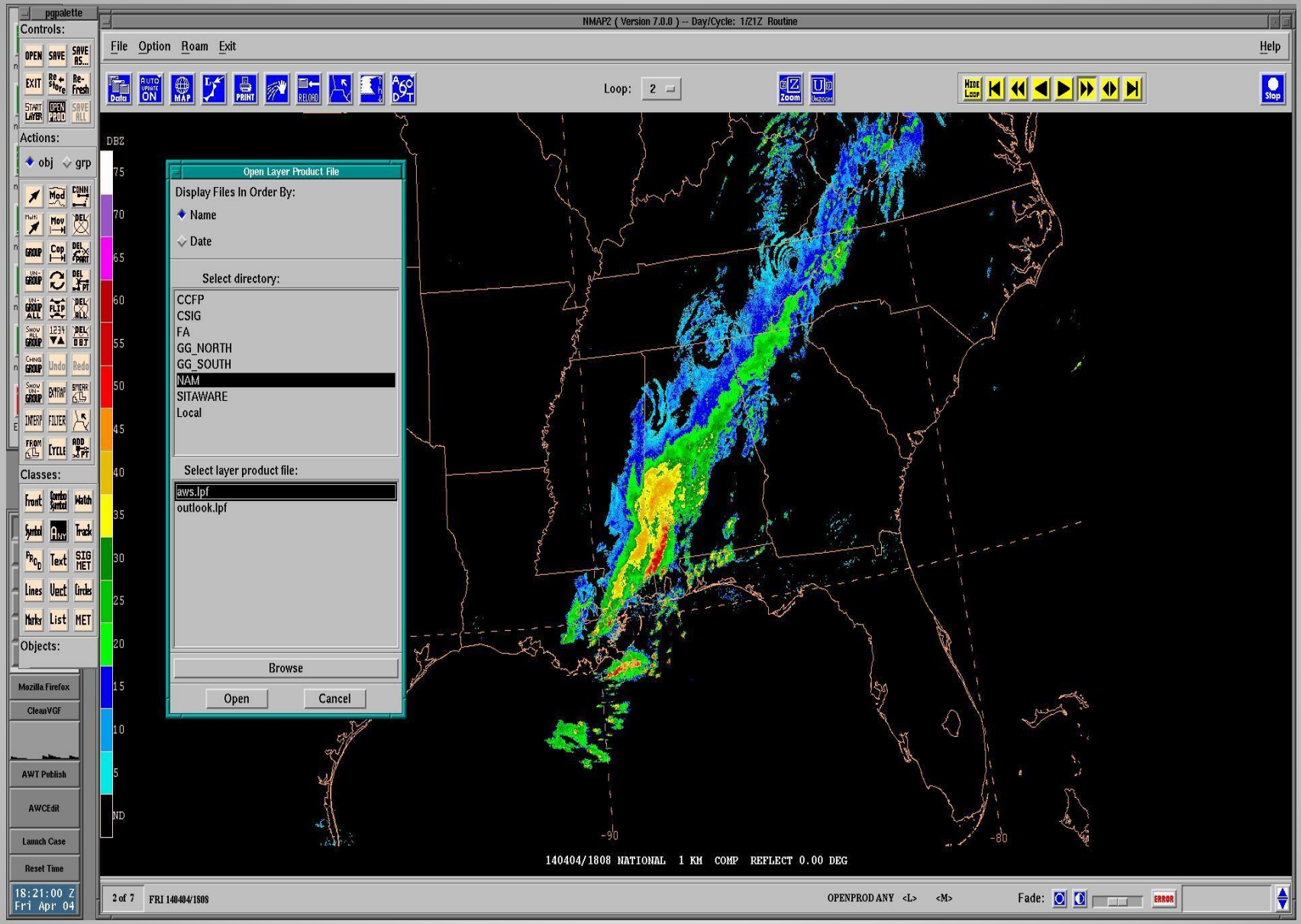
GOES-R Cloud-top cooling (CTC) output from 20 August 2013 at 1332 UTC. The first CTC signals further narrowed down particular issue areas when used with the convective initiation (CI) tool. The TX and LA border became an area of AWS concern with both higher CI probabilities and moderate CTC cooling signals.

AWT and GOES-R Blog

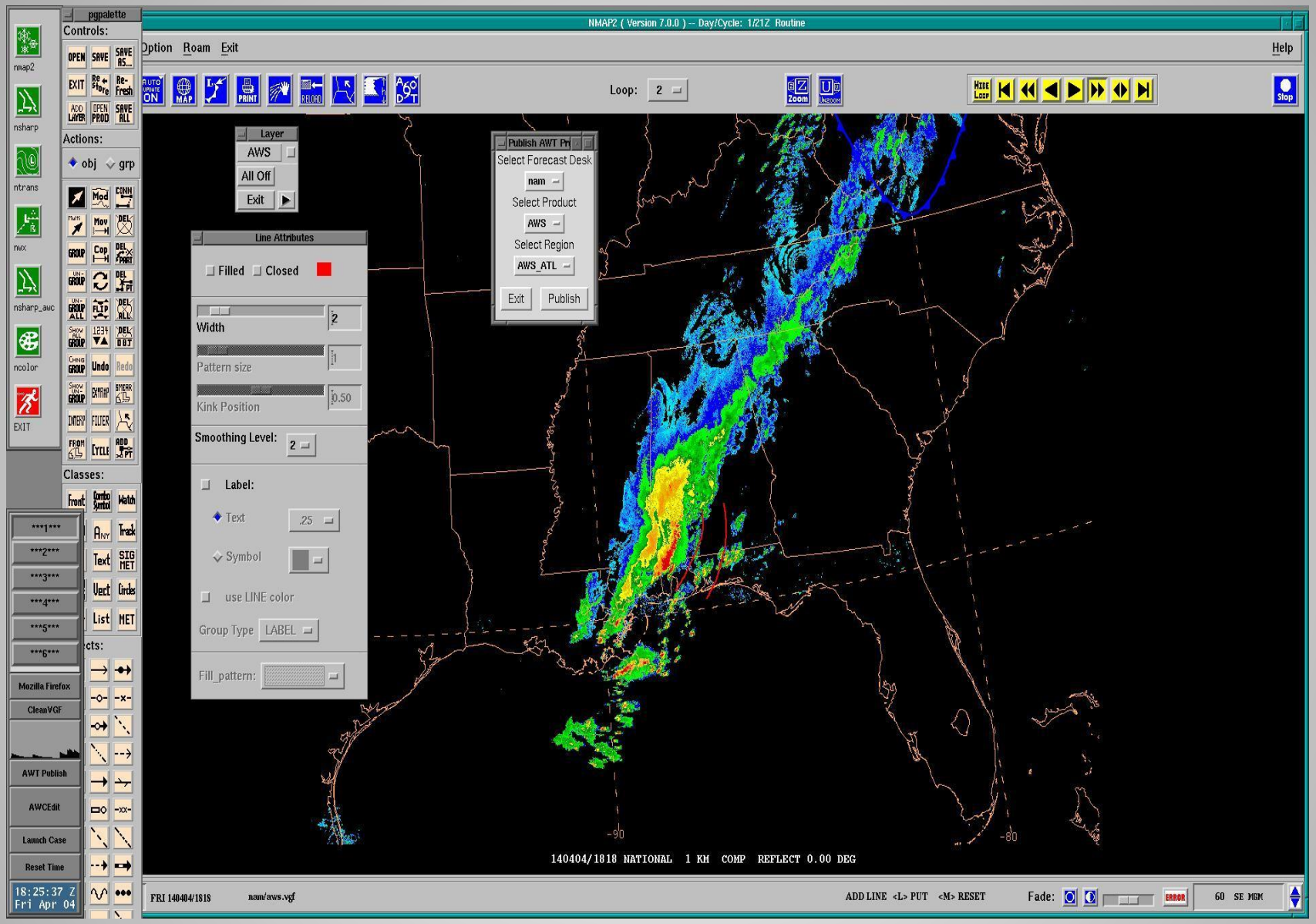
- Blogs are a great way to get initial results and findings recorded for further examination later. This is accomplished by Aviation Support Branch (ASB) staff and is a primary mechanism to record feedback from users.
- http://awtse.blogspot.com/
- http://goesrawt.blogspot.com/

NMAP Testbed Publish Interface for Product Issuance

- The goal was to have an experimental product publish mechanism similar to what AWC forecasters already use to put the emphasis on the experimental design instead of a being distracted by new 'knobology'
- All experimental desks had similar GUI created that were designed to resemble current operations
- The publish commands went to the testbed website for future evaluation (post mortems)
- The streamlined process actually allowed the AWT to issue Aviation Weather Statement's for the NAM on a busy convective day August 22.
  - Reduced the current workload of the NAM at the command center as the AWS is still just an experimental product
- This process will continue in future experiment and may actually replace some less intuitive publish mechanism in current AWC operations

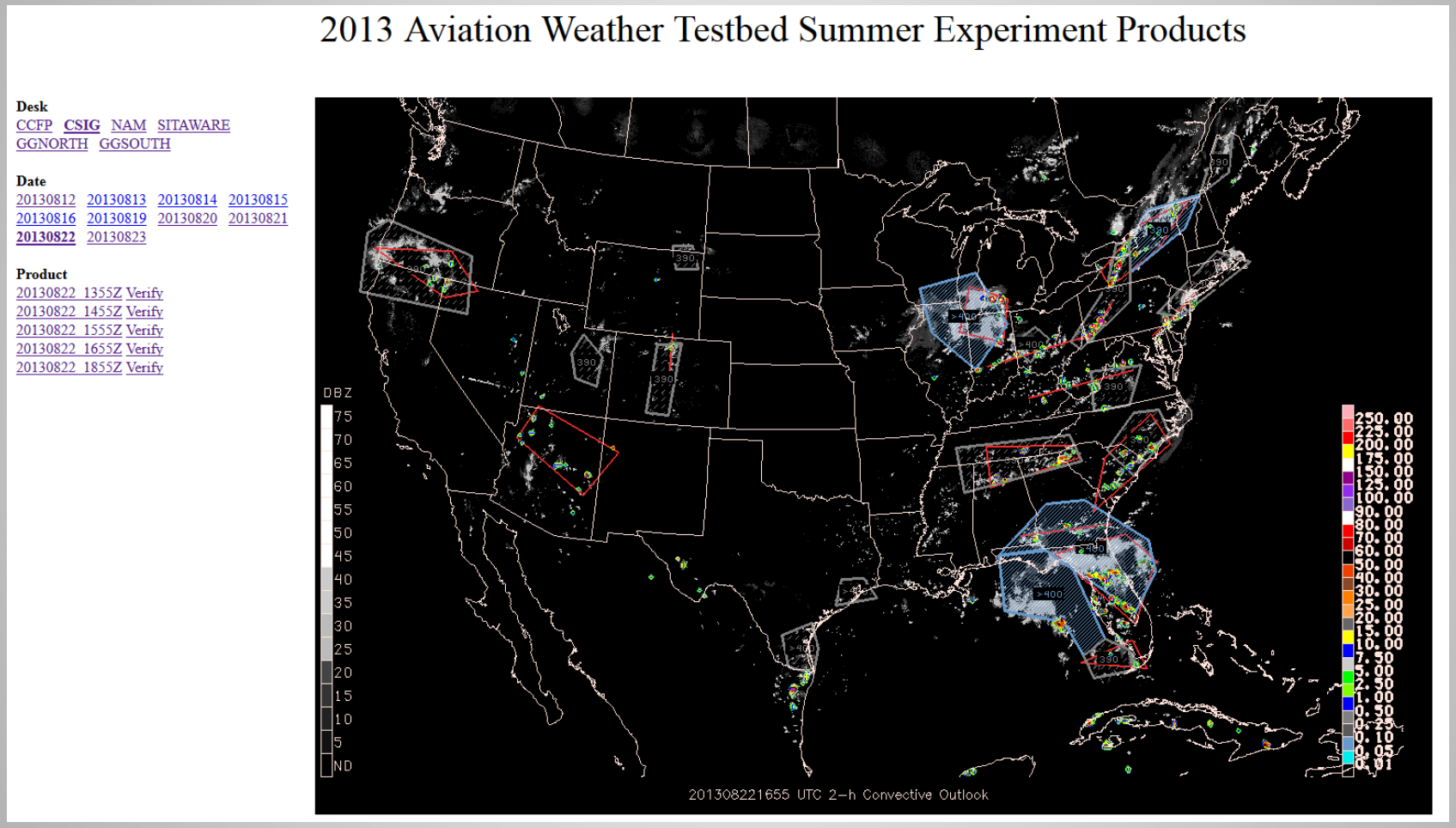


First step is to select an .lpf file for the product and desk you are working. Similar to how AWC operations issue products.



Second step is to create the product using the layer tool, and then publish the product using the drop down menu GUI, the published product ends up on the testbed website for later use.

Experimental Products Webpage



The 2013 Summer Experiment webpage allowed for quick qualitative verification images to be created for next day post-mortems on events. The example above shows the 2-h experimental CSIG outlook overlaid with gray-scale reflectivity and total lightning density observations. This was viable through the creation of an easy to use publish GUI within NMAP similar to what the AWC forecasters use daily.

Conclusions

- Wide audience of users and producers…good O2R, R2O
  - Brownbag seminars were a big hit, more detail given for experimental products and useful Q&A sessions
- Easy to use graphical user interfaces were a necessity
  - Similar to AWC operations allows the forecaster participant to focus on the experiment goals instead of learning new 'knobology'
  - Enables live experimental product publication from the testbed
- Assimilating new technology into decision making process
  - Having GOES-R support onsite is invaluable
  - Having product producers on hand for questions increases user confidence down the road
- Challenges: getting feedback
  - User vs. producer, survey forms/web?
  - Blog is useful but sometimes things are missed